

Table of Genera.

Females.....	1
Males.....	8
1. Antennæ 10-jointed.....	2
Antennæ 9-jointed.	7
2. Apterous.....	5
Winged,	
Mesonotum without a furrow.....	4
Mesonotum with a median impressed line.....	3
3. Scutellum flat or subconvex, with a marginal frenum.....	Ceraphron <i>Jurine</i>
(type <i>C. sulcatus</i> JURINE).	
Scutellum convex, acuminate, without a frenum.....	Aphanogmus <i>Thomson</i>
(type <i>A. fumipennis</i> THOM.).	
4. Antennæ subclavate.....	6
5. Mesonotum with a median impressed line.	
Scutellum flat or subconvex, with a frenum.....	Ceraphron <i>Jurine</i>
Scutellum convex, without a frenum.....	Aphanogmus <i>Thomson</i>
6. Scutellum distinct.....	Aphanogmus <i>Thomson</i>
Scutellum not at all differentiated.....	Ecitonetes <i>Brues</i>
(type <i>E. subapterus</i> BRUES).	
7. Mesonotum with a median impressed line.....	Neoceraphron <i>Ashmead</i>
(type <i>Ceraphron macroneurus</i> ASHM.).	
8. Antennæ 11-jointed.....	9
Antennæ 10-jointed.....	12
9. Mesonotum with a median impressed line.....	10
Mesonotum without a median impressed line.	
10. Scutellum depressed or flat, without a frenum; antennæ simple, not serrate.	
Scutellum convex, acuminate, without a frenum; antennæ serrate.	Ceraphron <i>Jurine</i>
	Aphanogmus <i>Thomson</i>
11. Scutellum convex, acuminate, without a frenum.	
Antennæ serrate.....	Aphanogmus <i>Thomson</i>
12. Mesonotum with a median impressed line.	
Antennæ filiform.....	Neoceraphron <i>Ashmead</i>

NOTES ON COCCINELLIDÆ.

BY CHARLES W. LENG, B.S.

Major Thomas L. Casey's "Revision" of this family, printed in this Journal (Vol. VII, pp. 71-169), describes several new species: and the following notes result mainly from a study of his work and of the material in the collections of Messrs. Schaeffer, Roberts, Love, O'Conner, Luetgens, Marshall, Ouellet, Knaus, Wickham and Davis,

as well as my own. I have also been allowed to study the material in the American Museum of Natural History, through the kindness of Mr. William Beutenmüller.

The preceding papers by American authors are by LeConte, Proc. Acad., 1852, Vol. VI, p. 129; Trans. Am. Ent. Soc., 1880, Vol. VIII, p. 186; Crotch, Trans. Am. Ent. Soc., 1873, Vol. IV, p. 363; Horn, Trans. Am. Ent. Soc., 1895, Vol. XXII, p. 81. Since the publication of Major Casey's "Revision," Mr. F. C. Bowditch has published (Ent. News, Sept., 1902) some critical notes.

Some of these authors have been apparently handicapped by insufficient material; and it is to be regretted that, while the larger species are represented in most collections, the smaller species are usually represented by few specimens.

Collectors should not fail to take large series of the species of *Hyperaspis* and *Scymnus* on account of the interest they possess from the variety of their markings and their economic importance.

With few exceptions the Coccinellidæ are beneficial insects, feeding in the larval stage and as imagines on plant lice and scale insects. The reports of the various State Entomologists contain numerous references to their predaceous habits, the summary of which is that while they doubtless eat some vegetable matter, pollen for example, their food consists largely of injurious insects. There is room for original investigation in this direction.

The standpoint of Major Casey in regard to the relation between American species and the related foreign forms is quite different to that of previous authors. He apparently regards each geographic race as entitled to a specific name, though in some cases he uses the word subspecies; while his predecessors have sometimes sought to emphasize the relationship by the suppression of varietal names.

Tribe 1. *Hippodamiini*.

The body is more elongate and loosely formed; the upper surface is glabrous; the legs are longer and less retractile than in the following tribes.

The genera may be separated as follows:

Claws simple.....	Anisosticta.
Claws with a large quadrate basal tooth.....	Megilla.
Claws toothed near base.	
Antennæ simple.....	Paranæmia.
Antennæ with third jointed dilated.....	Ceratomegilla.
Claws bifid.....	Hippodamia.

Næmia is included with *Anisosticta*; *Adonia* is included with *Hippodamia*; *Eriopsis* is omitted for reasons stated below; *Macronæmia* is included with *Anisosticta*.

Anisosticta *Dufouchel.*

3033. **A. strigata** *Thunb.*, 1794. Northern States and Canada.

Ovate, black; head yellow, black at base; legs, antennæ, sides of abdomen and last segment yellow; thorax and elytra yellow, evidently punctate; thorax with two obtriangular spots (the external corner often isolated as a dot); elytra each with eight spots and a common bilobed scutellar spot black (the two pairs near the suture are often confluent, and then the external row forms a sinuous band). Length, 3.25 mm. = .13 inch.

The name *bitriangularis* Say is preferred by Major Casey, who states the American form is distinct from the European. The black markings of the elytra and thorax are heavier in eastern than in western specimens and two names may be necessary if we distinguish geographic races. A specimen from Manitoba (figured in plate) in Professor Wickham's collection is conspicuously pale. For the present I believe it will be preferred to use the original name of the species for all its forms.

3034. **A. seriata** *Mels.*, 1846. Maritime regions of Atlantic States and southern California.

Ovate, black; tibiæ, antennæ, sides of abdomen reddish-yellow; thorax and elytra reddish-yellow, punctulate; thorax with two large obtriangular spots connected at median line; elytra each with five spots and a common scutellar spot black. Resembles *Megilla maculata* but may easily be known by the entirely black head and the confluence of the spots. Specimens from southern California are redder and have the elytral spots barely connected. Length, 4.5 to 6.5 mm. = .18 to .26 inch.

This species was made the type of *Næmia* by Mulsant and in this he is followed by Major Casey but in view of the feeble characters used I prefer to retain the arrangement of the check list. The name *litigiosa* Muls., might be revived for the southern California form if it were desired to distinguish the geographic races of this species.

3035. **A. episcopalis** *Kirby*, 1837. Canada, Kansas, Wyoming, Colorado (April to June in sweepings, Wickham), Lake Tahoe, California (Fall).

Elongate, parallel, bright yellow, body black; head black behind and with two black vittæ; thorax rounded behind, sinuate before the posterior angles, rather finely punctate with a large three-lobed mark on either side the median line; elytra more strongly punctate, suture narrowly black and a discoidal vitta more broadly black (neither of them reaching the apex). Length, 3.75 mm. = .15 inch.

This species has not the characters by which Mulsant sought to separate *Næmia*; if it is to be separated from *Anisosticta* it should be

under Casey's name *Macronæmia*. I prefer to simplify the list by restoring it to *Anisosticta*.

Megilla Muls.

3036. *M. maculata* DeG., 1775. Canada, United States and southward, except Pacific coast.

Ovate, black, alutaceous, thorax and elytra reddish, spotted with black, punctulate; head black with a triangular frontal red spot; thorax with an obtriangular black spot on either side the median line; scutellum black, elytra with two common spots (one scutellar, one at three fourths) and four arranged longitudinally, one on the callus, one medial larger, one at three fourths and one subapical. The spots become reduced in the variety *floridana*. Length, 4 to 7 mm. = .20 to .28 inch. This species hibernates gregariously.

This species may be divided into geographic races and if this be done our common form will be known as *fuscilabris*. Major Casey has described a large form from Brownsville, Tex., under the name *strenua* and there is still a third form occurring in Florida and Louisiana which is separated already in many collections and may be called *floridana*. These varieties may be separated as follows:

Larger form with fully developed markings.

Prothorax less than twice as wide as long; 4.7 to 6.2 mm..... **fuscilabris.**

Prothorax twice as wide as long; 5.2 to 7.2 mm..... **strenua.**

Small form with feebly developed markings; 4.5 to 5 mm..... **floridana.**

Megilla floridana, var. nov.

Head black, with a triangular red mark; thorax red, with two small basal black marks; elytra red, with a common scutellar black spot and each with humeral, antemedian, two postmedian and apical black spots. The spots are small and separated by more than their own diameter. The inner of the two postmedian spots is not sutural nor is it usually coalescent with the corresponding spot of the other elytron as in the variety *fuscilabris*. Length 4.5-5 mm.

Habitat: Florida and Louisiana (Vowell's Mill).

I regard this as a well-marked race of *maculata*.

Paranæmia Casey.

This genus differs from the preceding by the forms of the tarsal claws, as shown in figure, and by the pattern of maculation. I think it should be recognized.

3037. *P. vittigera* Mann., 1843. Col., N. Mex., Ariz., Cal., on herbage in swampy places.

Ovate, black, alutaceous; thorax as in the preceding; pale spot of the head small or lacking in female; elytra with suture and a dorsal vitta black, both are attenuate towards the apex, which they do not reach. Length, 5 to 5.5 mm. = .20 to .22 inch.

Major Casey has separated under the name *similis* specimens from Colorado and Arizona in which the form is more elongate, the thorax especially so and more rounded at base. I can trace the differences described in the large series I have examined, but do not believe they indicate more than a feebly defined race.

Ceratomegilla Crotch.

3038. **C. Ulkei** Cr., 1873. Hudson's Bay.

"Oval, sub-opaque, antennæ, tarsi and palpi ochreous; head with a white spot in front of each eye, thorax with the sides bordered with ochreous, anterior angles broadly ochreous, and a very minute line in the middle of the anterior margin also ochreous; elytra rather closely punctate, a triangular spot on the base, the external margin irregularly, and an elongate common sutural spot near the apex fulvous. L. 22 inch (5.5 mm.)."

The claws are dentate at base and the antennæ have the third joint longer than the second, broadly dilated at apex, with the inner angle ciliate.

Unknown to Major Casey and not represented in any of the collections I have seen. I repeat the description of Crotch (Trans. Am. Ent. Soc., IV, 365).

Adonia Muls.

3039. **A. constellata** Laih., 1781. Nova Scotia.

"Black, tibiæ, antennæ and entire front of the head pale; thorax with a narrow border, an abbreviated medial line connected with the anterior margin and a round dot on either side white; elytra clearly and rather coarsely punctate, with a scutellar spot and six others (as in *Hippodamia*) variously united or absent. L. 19 inch = 4.7 mm."

This is a European insect and the name is cited as a synonym of *variegata* Goeze in the Gemminger & Harold Catalogue, and in the later Henshaw list. It is not represented in any of the collections I have seen. I quote Crotch's description.

I think this species should be omitted from our list.

Eriopsis Muls.

3040. **E. connexa** Germ., Texas, California, Vancouver.

Oblong, black, extremely finely and obsoletely, head more visibly, punctate; thorax with the sides, and a spot on the front and hind margins yellow; elytra with the margin, base and two dorsal spots yellow; the marginal line is dilated in five places, one basal, one subhumeral, one medial, one at three fourths and one sub-apical. L. 122 inch = 5.5 mm.

This is a South American insect, which has very seldom been found in the United States, even if the records are authentic.

I think this species should be omitted from our list.

This genus and the preceding are very close to *Hippodamia*.

Hippodamia *Muls.*

The synopsis by Crotch includes only part of the now known species; the later synopsis by Casey omits several of the previously described species; I am therefore compelled to offer a new synopsis. Our species fall into three groups distinguished by the character of the sternal plates or more readily by the markings of the thorax, viz :

- Thorax with broad white lateral margins within each of which is a black dot. The black dot is sometimes connected with the interior black portion, the latter being without the discal divergent lines.....Group 1
 Thorax with a white quadrate spot at the middle of the base and white lateral and anterior margins variously interrupted.....Group 2
 Thorax with a white lateral margin often interrupted at middle or reduced to an anterior marginal spot. In this group occur all the species with discal divergent lines on the thorax, but some species are without them.....Group 3

Group 1 consists of one species, *13-punctata*. Group 2 consists of one species *parenthesis*. Group 3 consists of several species separable as follows :

- Anterior half of elytra without markings or with only a humeral black dot...**glacialis**
 Elytra with a black subbasal band often reaching the humeri, with or without other marks.....**5-signata**
 Elytra with a common black scutellar spot in the form of a trilobed star, with or without other marks.....**Lecontei**
 Elytra black with a subapical red spot.....**mcesta**
 Elytra immaculate.....**ambigua**
 Elytra with six small spots, seldom even partly confluent..... **convergens**
 Elytra with sutural margin wholly or partly black and each with four spots distinct or united or with a sinuous vitta formed by the union of the spots.....**sinuata**
 Elytra with a broad subbasal band and a large medial spot.....**dispar**

3041. **H. 5-signata** Kirby, 1837.

Extends from New York (Adirondacks) to California, following a northern range but descending also to Colorado, Utah and New Mexico in the mountains.

In the most heavily marked form the thorax is all black except the anterior angles, and the elytra have three black bands, one subbasal, very broad, disconnected at suture; one post-median also broad but abbreviated, the third subapical and scarcely more than a good-sized spot. In the palest form the thorax has a white margin and discal lines, the elytra bear no marks behind the subbasal band which is

much reduced. This form is confined to the Pacific coast and is *extensa* Muls. Between these two extremes occur very many intermediate forms, some of which have been named by Major Casey, but in view of the variability of the large series before me collected at various points in the Rocky Mts. by Mr. E. J. Oslar, I am not sure that these names represent even established geographic races. For cabinet arrangement these forms may be arranged as follows if desired :

Three elytral bands	5-signata
Subapical band or spot lacking	leporina Muls. (<i>vernix</i> Csy.)
Subapical band lacking, middle band represented by two spots	unnamed.
Subbasal band narrower, others represented by small dots (united in Csy.).....	puncticollis
Middle and apical band lacking.....	extensa Muls.

The last occurs as far as I know only west of the Sierra Nevada, is certainly a good variety and should be added to our list as

3041a. **H. extensa** Muls., 1851. California.

3042. **H. ambigua** Lec., 1852. California and Oregon.

With this species, itself closely related to the preceding I include as geographic races *obliqua* and *politissima* of Casey. All the forms have immaculate elytra rarely a few small spots but may be separated as follows :

Thorax without discal divergent lines.....	ambigua .
Thorax with discal divergent lines.	
Elytra feebly alutaceous	obliqua .
Elytra highly polished	politissima .

The discal divergent lines of the thorax when present may be represented by two short dashes at middle of thorax, or they may be so extended as to leave only a narrow black design on a white ground. In the series collected for me by Miss Dennis at Dilley, Oregon, every intergrade can be found.

3043. **H. Lecontei** Muls., 1851. Colorado to California.

In this species the trilobed scutellar spot is accompanied by humeral spot, post-median spots or band and subapical spot and its pattern of maculation closely resembles that of *5-signata*.

3043a. **H. mæsta** Lec., 1854. British Columbia, Oregon.

Very distinct from all others and I know of no reason for regarding it as a variety of the preceding.

3044. **H. glacialis** Fab., 1775. Northeastern America.

No division of this species has been proposed. Major Casey is in

error in saying "anterior spots always wanting." About half the specimens I have seen have a small black humeral dot as well as the post-median band and subapical spot.

3045. **H. 15-maculata** Muls., 1851. Kansas and Arkansas.

I regard as a variety of *convergens*.

3046. **H. convergens** Guer., 1846. North America.

The pattern of maculation in this widely distributed species is six spots on each elytron and a scutellar spot. The discal divergent lines are usually well developed. The variations are :

Elytra immaculate.....	obsoleta Lec.
Anterior and scutellar spots coalescent.	unnamed.
Postmedian spots coalescent.....	juncta Csy.
All the spots enlarged and partly coalescent.....	15-maculata Muls.

3047. **H. spuria** Lec., 1861. Oregon, Vancouver.

"This species has the form and size of our common *H. parentthesis*, but the thorax of *H. convergens*. The elytra are more elongate oval in form than in either, and more obtusely rounded at tip; the apical angle is also not at all acute, but on the contrary, quite rounded. The spots of the elytra vary greatly; the scutellar elongate spot is sometimes prolonged on the sutural margin for two thirds the length; the first and second, or the second and third of the posterior spots are connected sometimes as in varieties of *H. parentthesis*, and specimens will undoubtedly be found in which all three are united to form an arcuated spot. It is also probable that *H. sinuata* Muls. is an extreme form of this species. Long. .20. Oregon."

I consider this a variety of *sinuata* to be separated as noted below.

It seems as if Major Casey had somehow been misled in regard to this species as his description does not coincide with that of Dr. Leconte and the locality (Colorado) cited is, in my belief, far from the region inhabited by Leconte's species. Leconte's description is here quoted.

3048. **H. oregonensis** Cr., 1873. Oregon.

Differs from the preceding by the absence of the discal divergent lines on the thorax. I believe that this is a form of *sinuata* var. *spuria*, but in the absence of sufficient specimens I am obliged to leave the name in doubt.

3049. **H. sinuata** Muls., 1851.

var. **spuria** Lec., 1861. Oregon, Vancouver, Washington.

var. **trivittata** Casey, 1899. California.

true **sinuata** Muls., New Mexico.

var. **spuria** Casey., Utah, Col., N. Mex., Nev.

In this species the basis of the markings may be regarded as four spots, one subhumeral, one subsutural near the middle, one submarginal behind the middle and one subapical. There is also a sutural stripe, more or less developed.

In the true *sinuata* the spots unite to form a vitta arcuately sinuate posteriorly. Sometimes the union is incomplete, the apical spot being separated (*americana* Cr.). The sutural stripe is narrow and reaches nearly to the apex. The color is quite reddish. All the specimens I have seen are from New Mexico.

In the variety *spuria* Lec., the subhumeral spot is usually separate and the three posterior spots are wholly or partly united, forming an arcuate spot as in *parenthesis*. The subhumeral spot, however, may also be united, in which case we have the form called *complex* by Casey. I include under *spuria* Lec., also *oregonensis*, differing only by the absence of discal thoracic lines, a character instable in a preceding species. In *spuria* Lec., the sutural stripe is a short broad mark surrounding the scutellum as in *parenthesis*. The color is paler than in *sinuata*. The home of this variety is in Vancouver, Oregon, and Washington, but I have a specimen collected by Mr. Warren Knaus in Kansas, which could be placed here.

In the variety *trivittata* the vitta of *sinuata* is almost reproduced, but I have seen no specimens in which the vitta is broken by the separation of the apical spot and the situation in the vitta is less marked, so that, as Major Casey says, the design is very much like that of *Paranæmia vittigera*. The sutural stripe is usually very long, but it is sometimes a short scutellar blotch as in the preceding variety which makes the form called *crotchi* by Casey. The color is comparatively pale in this variety. Its home is in California. It is probable that *falcigera* Cr., differing only by the absence of discal thoracic lines, is to be included here in which cases Crotch's name must be used; but I have seen no specimens from the locality named by him (Slave Lake, Hudson's Bay) and I prefer to leave this name in doubt for the present.

In the variety called *spuria* in Major Casey's paper (but which is really nameless for, as I read the descriptions, *spuria* is preoccupied) the four spots are entirely separated, or the two middle spots may be united, or some of the spots may be lacking. The sutural stripe is usually short and narrow. The color is yellow, or reddish-yellow in specimens from New Mexico. I have specimens from Utah, Colorado, Kansas, New Mexico, Nevada, Dakota, Idaho and Wyoming

and a specimen from Vancouver in Professor Wickham's collection has the markings so reduced as to be placed here.

It seems to me as if all these forms constituted one species which may have originally had the four spots; with a tendency to establish the varieties *sinuata*, *trivittata* and *spuria* Lec., in each of which, however, there is a tendency to revert to the ancestral type.

3050. **H. 13-punctata** Linn., 1735. Europe, Siberia and the United States.

No division of this species has been proposed.

3051. **H. parenthesis** Say, 1824. British America and the northern part of the United States, extending to Colorado in the mountains and from New England to California.

There is a great variation in the elytral markings, as will be noted by the figures. The quadrate white spot at the base of the thorax seems to be constant. Major Casey has proposed the name *apicalis* for that form in which the subapical spot attains the suture and apical angles, but I doubt very much if this indicates an established race. If so, it should be cited as

3051a. Var. **apicalis** Casey, 1899. Nevada and California.

3052. **H. falcigera** Crotch, 1873. Slave Lake, Hudson's Bay.

"Black, clearly and finely punctulate; head with a small frontal spot, yellow; thorax with a narrow uniform border yellow, no discal spots; elytra yellow with the suture black (narrowing out before the apex) and each with a black equally broad vitta suddenly incurved before the apex; meta-epimera black. L. .22 inch."

This I have not seen, but as stated above, I believe it to be the variety of *sinuata* called *trivittata* by Major Casey. The above is a copy of the original description.

3053. **H. americana** Crotch, 1873. Kansas, Hudson's Bay.

Under this name Crotch described *sinuata* with the apical spot detached and I do not think that the name can be anything but a synonym unless it be regarded as the first description of a departure from the true *sinuata* form and hence including all other departures in the same direction. In this view the name could be used for the fourth variety of *sinuata*, called *spuria* by Major Casey.

3054. **H. variegata** Goese, 1777.

Should be dropped. See under *Adonia constellata* above.

H. dispar Casey, 1899. Colorado.

Oval, black; antennæ, epimera, frontal spot, anterior and lateral margins of thorax and elytra pale; elytra with subbasal band equally broad throughout and a broad post-median spot, black; surface of elytra strongly alutaceous and rugulose;

thorax closely punctate; body smaller and more depressed than usual in this genus. Length, 4.5 mm. = .18 inch.

I have not seen the type and the figure is drawn from a specimen in my own collection from the same locality and seemingly identical with the insect described by Major Casey. Mr. Blanchard has specimens from New Mexico, collected by Prof. F. H. Snow in which the subbasal band and median spot are connected. The elytra in one specimen bear also a disconnected subapical spot. I regard these as a form of *dispar*.

NOTES ON THE CEROSTOMA GROUP OF YPONOMEUTIDÆ, WITH DESCRIPTIONS OF NEW NORTH AMERICAN SPECIES.

BY AUGUST BUSCK.

While endeavoring to arrange some American moths of the *Cerostoma* group and for that purpose examining critically the European species placed in that genus by modern European authors, I was surprised by the diversity of forms included under that generic name. Meyrick, in his Handbook of British Lepidoptera, includes in *Cerostoma* all English Yponomeutidæ which have veins 6 and 7 in the hindwings stalked. This is at least more consistent than the course pursued by Rebel in the Catalogue of European Lepidoptera, where he places one of them, *mucromella* Scopoli, under a separate genus *Theristis*, leaving the rest, which readily separate into four just as distinct genera, in *Cerostoma*. The natural way seems to be to divide the group into the five genera defined by Wallengren (Ent. Tidskrift, I, p. 53, 1880), but some of his generic names will fall in favor of Hübner's earlier terms.

The genus *Cerostoma* was founded by Latreille (Hist. Nat. des Crust. et Ins., Vol. III, p. 416, 1802) and was characterized as follows: "Ailes tres-alongées, étroites, moulés sur le corps. Quatre palpes distinctes; les superieurs droits, les inferieurs long et recourbés; leur second article penicilliforme, le dernière conique, alongé, presque nu."

The type of this genus is *Ypsolophus (Alucita) dorsatus* Fabricius, that being the only species mentioned by Latreille both in this volume and in Vol. XIII, p. 247, 1805.